UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/708,340	02/25/2004	Hiroyuki Akatsu	FIS920030411US1	2339

32074 7590 04/13/2006

INTERNATIONAL BUSINESS MACHINES CORPORATION
DEPT. 18G
BLDG. 300-482
2070 ROUTE 52
HOPEWELL JUNCTION, NY 12533

EXAMINER	
NGUYEN, DAO H	
ART UNIT	**PAPER NUMBER**
2818	

DATE MAILED: 04/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/708,340	AKATSU ET AL.	
	Examiner	Art Unit	
	Dao H. Nguyen	2818	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 January 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 3-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 3-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 January 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. In response to the communications dated 01/26/2006, claims 1, 3-10 are active in this application.

Claims 2 and 11-20 have been cancelled.

Remarks

2. Applicant's argument(s), filed 01/26/2006 have been fully considered, but are moot in view of the new ground(s) of rejection(s).

Claim Objections

3. The claim is objected to for the following reason: claim 5 originally depends on claim 2; however, claim 2 has been cancelled. Therefore, appropriate correction to the dependency of claim 5 is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claim(s) 1 are rejected under 35 U. S. C. § 102 (b) as being anticipated by U.S. Patent No. 6,680,494 to Gutierrez-Aitken et al.

Regarding claim 1, Gutierrez-Aitken discloses a bipolar transistor, as shown in figs. 5-7, comprising:

a collector 5/3 (see col. 6, lines 66-67 and figs. 6-7) including a frustum-shaped collector pedestal having an at least substantially planar upper surface, a lower surface, and a slanted sidewall extending between said upper surface and said lower surface, wherein said upper surface has an area substantially less than an area of said lower surface;

an intrinsic base 7 overlying all of said area of said upper surface of said collector pedestal 5/3;

an emitter 9 overlying said intrinsic base 7;

a raised extrinsic base 13 conductively connected to said intrinsic base 7; and

a dielectric region 17 extending alone said slanted sidewall of said collector pedestal 5/3 adjacent to said upper surface.

6. Claim(s) 1, 3, 4, and 7-10 are rejected under 35 U. S. C. § 102 (b) as being anticipated by U.S. Patent No. 5,481,120 to Mochizuki et al.

Regarding claim 1, Mochizuki discloses a bipolar transistor, as shown in figs. 1, 2, 5-8, 26, 27, 50, 65, comprising:

a collector 3 (fig. 1 or fig. 27) or 110 (fig. 65) including a frustum-shaped collector pedestal 3 having an at least substantially planar upper surface, a lower surface, and a slanted sidewall extending between said upper surface and said lower surface, wherein said upper surface has an area substantially less than an area of said lower surface;

an intrinsic base 5 (figs. 1 or 27) or 111 (fig. 65) overlying all of said area of said upper surface of said collector pedestal 3/110;

an emitter 8 overlying said intrinsic base 5;

a raised extrinsic base 6/16 (figs. 27) or 112 (fig. 65) conductively connected to said intrinsic base 5/111; and

a dielectric region 4 (fig. 1) or 24 & 4 (fig. 27) or 121 (fig. 65) extending alone said slanted sidewall of said collector pedestal adjacent to said upper surface.

Regarding claims 3 and 4, Mochizuki discloses a bipolar transistor comprising all claimed limitations. See embodiments 2, 10, and 26.

Alternately, it is noted that the limitation(s) "said collector pedestal is formed by ..." is/are process limitation(s), and the discussed claim is drawing to a product. The process limitation(s) of how the collector pedestal being formed has/have no patentable

weight in claim drawn to structure. Note that a "product by process" claim is directed to the product per se, no matter how actually made, In re Hirao, 190 USPQ 15 at 17 (footnote 3). See also In re Brown, 173 USPQ 685; In re Luck, 177 USPQ 523; In re Fessmann, 180 USPQ 324; In re Avery, 186 USPQ161; In re Wertheim, 191 USPQ 90 (209 USPQ 554 does not deal with this issue) and In re Marosi et al, 218 USPQ 289, all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product by a new method is not patentable as a product, whether claimed in "product by process" claims or not. Note that applicant has the burden of proof in such cases, as the above caselaw makes clear. MPEP §2113 states that "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985)."

Therefore, the recitation "said collector pedestal is formed by ..." in claims 3-4 is/are considered process(es) of making product(s) and has/have been given no patentable weigtht in product-by-process claims and is/are thus non-limiting.

Regarding claim 7, Mochizuki discloses a bipolar transistor wherein said emitter 8 is self-aligned to said collector pedestal 3. See figs. 1, 2, 5-8, 26, 27, 50, 65.

In addition, with regard to claim 7, it is noted that the limitation(s) "... self-aligned ..." is/are process limitation(s), and the discussed claim is drawing to a product. The process limitation(s) of how the base and/or emitter being formed has/have no patentable weight in claim drawn to structure. Note that a "product by process" claim is directed to the product per se, no matter how actually made, In re Hirao, 190 USPQ 15 at 17 (footnote 3). See also In re Brown, 173 USPQ 685; In re Luck, 177 USPQ 523; In re Fessmann, 180 USPQ 324; In re Avery, 186 USPQ161; In re Wertheim, 191 USPQ 90 (209 USPQ 554 does not deal with this issue) and In re Marosi et al, 218 USPQ 289, all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product by a new method is not patentable as a product, whether claimed in "product by process" claims or not. Note that applicant has the burden of proof in such cases, as the above caselaw makes clear. MPEP §2113 states that "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985)."

Therefore, the recitation "... self-aligned ..." in claim 7 is considered process(es) of making product(s) and has/have been given no patentable weigtht in product-by-process claims and is/are thus non-limiting.

Regarding claim 8, Mochizuki discloses a bipolar transistor wherein a centerline of said emitter 8 is aligned to a centerline of said collector pedestal 3. See figs. 1, 2, 5-8, 26, 27, 50, 65.

Regarding claim 9, Mochizuki discloses a bipolar transistor wherein said emitter 8 and said collector pedestal 3 are aligned within a single opening in a layered stack of materials. See figs. 1, 2, 5-8, 26, 27, 50, 65.

Regarding claim 10, Mochizuki discloses a bipolar transistor wherein said intrinsic base 5 includes a layer of a single-crystal semiconductor which forms a heterojunction with at least one of said emitter 5 and said collector pedestal 3. See figs. 1, 2, 5-8, 26, 27, 50, 65.

Claim Rejections - 35 U.S.C. § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claim(s) 5 and 6 are rejected under 35 U.S.C. 103 (a) as being unpatentable over U.S. Patent No. 5,481,120 to Mochizuki et al., in view of U.S. Patent No. 6,287,930 to Park.

Regarding claim 5, Mochizuki discloses a bipolar transistor comprising all claimed limitations, except for a shallow trench isolation wherein said dielectric region 4, (which includes a layer of silicon nitride, see col. 12, lines 14-16) extending between said shallow trench isolation and said slanted sidewall of said collector pedestal.

Park discloses a bipolar transistor shown in fig. 1, comprising collector including a frustum-shaped collector pedestal 13 having slanted sidewall extending between the upper surface and the lower surface of the collector pedestal 13, a dielectric region 15 extending along the slanted sidewall of the collector pedestal 13, and a shallow trench isolation 17, wherein said dielectric region 15 extending between said shallow trench isolation 17 and said slanted sidewall of said collector pedestal 13.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention of Mochizuki so that it would further include an isolation trench as that of Park in order to provide electrical isolation to the device. See col. 2, lines 13-27 of Park.

Regarding claim 6, Mochizuki discloses a bipolar transistor further comprising a dielectric spacer 26, wherein said raised extrinsic base 6/16 is self-aligned to said emitter and spaced from said emitter by said dielectric spacer.

In addition, with regard to claim 6, it is noted that the limitation(s) "... self-aligned ..." is/are process limitation(s), and the discussed claim is drawing to a product. The process limitation(s) of how the base and/or emitter being formed has/have no patentable weight in claim drawn to structure. Note that a "product by process" claim is directed to the product per se, no matter how actually made, In re Hirao, 190 USPQ 15 at 17 (footnote 3). See also In re Brown, 173 USPQ 685; In re Luck, 177 USPQ 523; In re Fessmann, 180 USPQ 324; In re Avery, 186 USPQ161; In re Wertheim, 191 USPQ 90 (209 USPQ 554 does not deal with this issue) and In re Marosi et al, 218 USPQ 289, all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product by a new method is not patentable as a product, whether claimed in "product by process" claims or not. Note that applicant has the burden of proof in such cases, as the above caselaw makes clear. MPEP §2113 states that "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is

unpatentable even though the prior product was made by a different process." In re Thorpe, 777F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985)."

Therefore, the recitation "... self-aligned ..." in claim 6 is considered process(es) of making product(s) and has/have been given no patentable weigtht in product-by-process claims and is/are thus non-limiting.

Conclusion

9. **THIS ACTION IS MADE FINAL.** A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dao Nguyen whose telephone number is (571)272-1791. The examiner can normally be reached on Monday-Friday 9:00am - 6:00pm. If

attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms, can be reached on (571)272-1787. The fax numbers for all communication(s) is (571)273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571)272-1625.

David Nelms
Supervisory Patent Examiner
Technology Center 2800

Dao H. Nguyen
Art Unit 2818
April 4, 2006

Accepted
dhn
04/05/06

FIG. 1
PRIOR ART

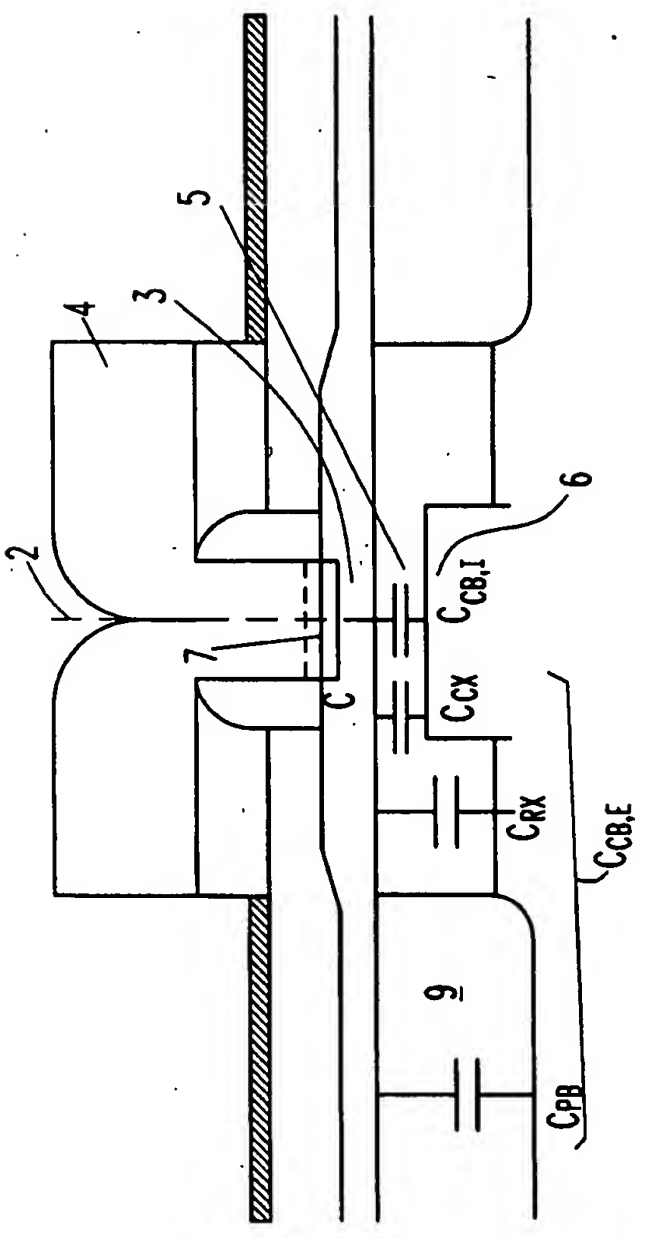

FIG. 2
PRIOR ART